

Drinking Water State Revolving Fund Green Project Reserve



Morning View Water Co. Drinking Water Project SRF Loan #DW1302 (pop. 250) \$530,000

Final Green Project Reserve Justification

Categorical GPR Documentation

1. INSTALL 110 WATER METERS WITH AMR SYSTEMS (Water Efficiency). Categorical GPR per 2.2-2a: *Installing any type of water meter in previously unmetered areas if rate structures are based on metered use* (\$54,680).

Business Case GPR Documentation

2. INSTALLS VFD CONTROLLERS FOR NEW WELL PUMP AND TWO EXISTING WELL PUMPS, (Energy Efficiency). Business Case GPR per 3.5-1: *Energy efficient ...new pumping systems...including VFDs* (\$31,670).
3. INSTALLS ADVANCED FLUORESCENT LIGHTING (Energy Efficiency). Business Case GPR per 3.5-7: *Upgrade of lighting to energy efficient sources such as ...compact fluorescent lighting;* (\$776).

Categorical

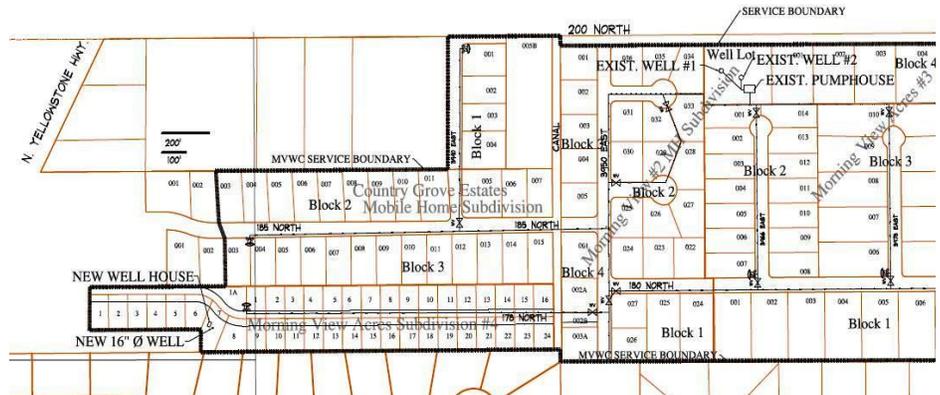
1. NEW WATER METERS¹

Summary

- The MorningView Water Company (MVWC) will purchase 110 remote-read water meters, installing 106 of the meters in existing meter boxes and the remainder in new meter pits.
- Loan amount = \$530,000
- GPR portion of loan (AMR) = 10% (\$54,680)

Background²

- The MVWC is a privately held public water system which services approximately 100 single family residences in an unincorporated area of Jefferson County, Idaho (see figure).
- The population serviced by MVWC is approximately 225 people via approximately 100 active individual connections. The historical average daily demand (ADD) for the years 2005 through 2007 was 167,000 gallons, with a peak hour demand of 720,000 gallons.
- As an unmetered community, the ADD consumptive values are very high (2.6 to 3.0 times) in comparison with metered communities
- The existing water system includes two wells and 3,400 feet of six inch diameter class 200 PVC water main.



Results

- The MVWC will install 110 Neptune 3/4" T-10 E-coder 900i water meters with Snub antenna for remote read. 106 of the boxes currently use an idler only - no meter.
- Installing water meters will increase water efficiency by providing accurate water-use information to customers and the system.

Conclusion

- Metering of water consumption is an important conservation measure because providing water bills based on consumptive use sends a strong price signal to customers resulting in more efficient consumption.
- Implementation of a tiered rate structure, after meter installation, will further aid conservation efforts extending the life of the water supply system and delaying capital expansion projects.
- **GPR Costs:**
 - Purchase meters = 110 meters @ \$310.24 each = \$34,126
 - Install 106 meters @ \$194 each = \$20,554
 - Total = \$54,680**
- **GPR Justification:** The project is Categorically GPR-eligible (Water Efficiency) per Section 2.2-2a: *Installing any type of water meter in previously unmetered areas if rate structures are based on metered use*³.

¹ Ryan Loftus P.E. Project Manager, Aspen Engineering July, 2013

² Final Facility Plan, Aspen Engineering, August 2010

2. PUMPING SYSTEM VFDs

Summary

- The MVWC will purchase and install variable frequency drives (VFDs) for the two existing wells along with a VFD for the new well.
- Estimated loan amount = \$530,000
- Estimated energy efficiency (green) portion of loan = 6% (\$31,670)

Background⁴

- Adequate system pressures are currently not being maintained.
- Analysis shows VFDs should be installed on the two existing wells (10hp & 30hp) as well as on the new well. The VFD contributes to energy efficiency as it allows the pump to operate at a reduced horse power or drive frequency, requiring less energy than a standard drive which operates at a set frequency independent of flow requirements.
- Provision of VFDs on the pumps will eliminate the need for air over water pressure tanks and will provide a much tighter range for pressure fluctuation. The VFD will save energy by assisting in maintaining constant system pressure; it will also reduce electrical consumption at times of pump start-up.

GPR Justification

VFD Analysis:

- The VFD specified is ABB Model ACH550-UH-097A-4, (UL Type1), 3ph/60ch/460v, NEMA 1 enclosure⁵.
- Assume the pumps are operational 20hr/day on a normal duty cycle.
- Three (3) VFDs cost = \$31,670; estimate pump operation = 7,300 hr/yr (normal distribution duty cycle), motor efficiency = 95.8%, and energy costs = \$0.12/kWh;
- Annual cost savings of the VFD (30hp pump) over standard drive = \$16,037⁶ with a payback period of 0.62 years⁶.
- Annual cost savings of the VFD (10hp pump) over standard drive = \$5,346/yr⁷ with a payback period of 1.87 years⁶.



Conclusion

- By installing VFD drives on the well pumps the City can save over \$21,000/yr. in energy costs.
- The VFDs are cost effective as the payback periods are well within the life of the equipment.
- **GPR Costs** (3) VFDs = **\$31,670**
- **GPR Justification:** The VFD systems are Business Case GPR-eligible, qualifying per Sect. 3.5-1 (Energy Efficiency)⁸: “Energy efficient... new pumping systems... (including variable frequency drives (VFDs))” which are cost-effective.

³ 2012 EPA Guidelines for Determining Project GPR-Eligibility. Attachment 2.

⁴ Final Facility Plan, Aspen Engineering, August 2010

⁵ MVWC project specifications, 4-14-14 email W Teucher P.E.

⁶ WEG Electric Corp. VFD Energy Savings Estimator at <http://www.weg.net/green/us/save-money.html>

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⁸ 2012 EPA Guidelines for Determining Project GPR-Eligibility. Attachment 2

3. FLUORESCENT LIGHTING

Summary

- Energy efficiency from the installation of advanced fluorescent lighting in the interior of the well house.
- Total Loan amount = \$530,000
- Estimated Categorical energy efficient (green) portion of loan = <1%
- Purchase and install fluorescent lighting for new well house = \$776

Energy Efficiency Improvements

- Energy efficient fluorescent lighting is approximately 28 percent more energy efficient than standard magnetic fluorescent lighting for relatively the same light output.⁹
- LED lighting is approximately 58 percent more energy efficient than typical high pressure sodium lighting for relatively the same light output.¹⁰
- Provide and install Fluorescent Strip Fixture: Lithonia No. C-2-32-MVOLT-GEB-WGCUN NST-HC36



Conclusion

- **GPR Costs:**

Equipment Name	Cost
Fluorescent Lighting	\$776
Total	\$776

- **GPR Justification:** Advanced fluorescent lighting is GPR-eligible by a Business Case per 3.5-7¹¹: *Upgrade of POTW lighting to energy efficient sources such as ...compact fluorescent.*

⁹ National Lighting Product Information Program, *Lighting Answers*, Volume 1 Issue 1, April 1993.

¹⁰ Global Green Energy, *ROI Analysis - 250W high pressure sodium vs. EcoBright 120W LED street light*, accessed via <http://www.gg-energy.com/>.

¹¹ Attachment 2. April 21, 2010 EPA Guidance for Determining Project Eligibility. Page 10.